

# ATOMIC ENERGY

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THE FIRST AND ONLY ATOMIC ENERGY NEWS PAPER

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Dear Sir:

A production plant to cost approximately \$1 billion and which will make Uranium-235 by the gaseous diffusion process is included in the new USAEC expansion program, now being drafted for submission to Congress. Prospective locations are now being studied (this LETTER, p.1, Apr. 8, 1952). Presently, the USAEC is surveying these locations for a site of 5-6,000 acres, for this new plant. Activities are concentrated in the Ohio River Valley due principally to the availability of potential power at reasonable cost, as well as adequate water supplies. Preliminary design of the new plant calls for one which will use about 1.8 million KW of power. From 4,000 to 5,000 operating workers will be needed; its construction period has been set at from 3½ to 4 years. Peak construction activity will probably utilize 34,000 construction workers. Electric generating facilities would be built, either by private industry or the Government, to supply the plant's power. Interim power requirements would gradually increase to 400,000 KW; this power would gradually be relinquished as the permanent power source is completed. In Uranium-235 production capacity, the plant will be larger than the Oak Ridge or Paducah, Ky. facilities. There will not be a "government-town" to house plant personnel, the USAEC has stated

Walter Kidde Nuclear Laboratories, Inc., the first privately-financed laboratory devoted solely to research in nuclear power, has now been formed. The parent organization, Walter Kidde & Co., manufactures fire protection devices for aircraft and marine applications, and is now doing contract work for the USAEC. The new Nuclear Laboratories unit will perform research, development and experimentation in the field of nuclear energy. Its services will be available to other organizations interested in the design of nuclear power plants or in applications of nuclear technology to their products and processes. Technical activities will be under the executive direction of Dr. Karl Cohen, former director of the atomic energy division of the H. K. Ferguson Co. The firm's development and engineering work will be conducted at 140 Cedar St., New York.

The "Declassification Guide" covering atomic energy information has now been revised by the governments of the United States, United Kingdom, and Canada. This guide is used by the three nations to determine what atomic energy information held jointly may be published and what information would remain under secrecy. The revisions are based on the recommendations made by the Fifth International Declassification Conference held last Fall in Washington, D.C. as a continuation of the wartime collaboration of the three nations. The principal revisions to the Declassification Guide will permit the release of additional data on the nuclear properties of uranium, data necessary in the development and understanding of low power nuclear reactors for atomic research. To speed the development of unclassified reactor technology in the three nations, design and operating data was previously declassified in November, 1950. The present action extends the information available to universities and laboratories engaged in unclassified research.

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INDUSTRIAL ATOMIC ACTIVITIES...

PROPOSALS INVITED- Additional proposals from private industry, for preliminary studies of the practicability of privately financed construction and operation of reactors for the production of fissionable materials and power, will now be considered by the U.S. Atomic Energy Commission. The proposals should be received by the Commission before June 1, 1952. In the Spring of 1951 the USAEC made contracts with four groups of companies for investigations aimed at expanding the participation of private enterprise in the national atomic energy program. At that time only four proposals could be accepted because of the USAEC's lack of manpower. However, the four original groups have made interim reports, and one group has submitted a final report which is now being studied by the USAEC: the other series of investigations are expected to be concluded in the near future. As under the present agreements, all costs on the first phase must be borne by the companies, except the time of personnel of the USAEC and its contractors. The proposals to be submitted should contain clearly defined objectives; each company will work independently of the others. The main goals of the studies would include: (1) Determination of the engineering feasibility of design, construction, and operation of a reactor by private enterprise. (2) Examination of the economic and technical aspects of building such a reactor. (3) Measure of the research and development work needed before such a reactor project could be undertaken. (4) Recommendations to the USAEC of what should be the specific role of industry in carrying out such a reactor project.

SUBMARINE POWER PLANT- The land-based prototype propulsion unit for an atomic-powered submarine, to be built by the Knolls Atomic Power Laboratory (KAPL), West Milton, N.Y., will be the power plant of an actual submarine in a portion of a submarine hull, according to a General Electric Co. engineer who recently addressed an audience at Johnstown, N.Y. (General Electric Co. operates KAPL under contract with the USAEC). W. N. Oberly, of KAPL, explained that the prototype will be, as far as possible, identical with the reactor, the propulsion equipment, and the submarine hull section as it will go to sea. The various contracts for excavation and building construction, which will be let on a fixed-price basis, are now in the first stages of negotiation, and some work has already started, Oberly said. The power plant building, which will be in the form of a steel sphere, 225 feet in diameter, should start going up this Summer, he stated.

ELECTRIC ENERGY SOURCE AT PADUCAH- Coal will be transported in river barges direct from mines or river-rail terminals for the boilers of an \$88 million generating plant being built along the Ohio River, near Paducah, Ky., by the Tennessee Valley Authority. Named the Shawnee River Plant, it will furnish about half the electric power for the \$500 million Uranium-235 plant now under construction at Paducah. Contracts for construction of a dock occupying some 2180 feet along the river, and a coal barge unloading system, have been awarded by TVA to Dravo Corporation, Pittsburgh, it has just been announced by that firm.

SALES GAIN REPORTED- A sharp increase in sales over the past few months was reported by Nuclear Instrument & Chemical Corp., Chicago, in a recent six month statement. Sales for the fiscal year ending Aug. 31st, 1952, should exceed \$1 million, compared to \$746,000 last year, the firm reported. The company's backlog of orders is over one-half million dollars, and Nuclear is presently working on large production contracts for both government and industry. It is expected that this backlog will continue to increase, the firm recently stated, with several anticipated production and development contracts now being negotiated. During the past six month period the company has expanded its floor space 20%. It is now spending approximately \$7,000 a month for development of new products. Nuclear's chemical department is completing experiments on radioactive algae compounds for which there is believed to be a market in medical and food research fields. It is the only commercial manufacturer offering compounds of this type.

BIDS ASKED- Invitations to bid on constructing a 4-5 million gallon reservoir as an addition to the Richland, Washington, water system are now being issued by the USAEC's engineering and construction division, 760 building, Richland. (Richland is the supporting community for the Hanford plutonium production plant.) Bids will be received until May 8. The site of the new reservoir will be on a hill across the Yakima river from Richland.

AT ATOMIC CITIES & CENTERS...

REACTOR TESTING STATION, Arco, Idaho- The Materials Testing Reactor, designed to produce a flow of intense neutron radiation, is now in operation at this station. The new reactor became critical the end of March, and is gradually being brought up to full power by the operating contractor, Phillips Petroleum Co., Bartlesville, Okla. Research and development work for the MTR was done by the Argonne and Oak Ridge National Laboratories, with engineering design performed by Blaw-Knox construction Co., Pittsburgh. The Fluor Corp., Los Angeles, was the major construction contractor. A mockup was constructed at the Oak Ridge Laboratory, and used to aid the design and then to train operators. The reactor core was fabricated at Oak Ridge, and shipped to the testing station for reassembly. The MTR now provides facilities for determining the effect of intense radiation on materials considered for use in the structures, heat transfer systems, and shields of new reactors. There are more than 100 ports on the MTR in which specimens can be exposed to neutron bombardment. While the reactor operates primarily on thermal, or slow neutrons, it also can subject specimens to neutrons with intermediate and fast energies. In addition to its testing function, the MTR contains features which may prove of value to reactors still on the drawing board. For example, it utilizes enriched uranium in units designed for rapid heat transfer. The coolant is water circulating at high velocity. The reactor, including engineering design and inspection, but excluding research and development, was constructed within the original cost estimate of \$18,000,000.

RAW MATERIALS...radioactive minerals for nuclear work...

UNITED STATES- Recent discoveries of uranium in South Dakota and Wyoming "point to a whole new area that is favorable for prospecting for uranium", the Geological Survey recently pointed out in Washington. The survey made the statement in discussing recent discoveries of uranium-bearing ores in the United States. Uranium was discovered last June in Craven Canyon, eight miles north of Edgemont, S.D., and other uranium deposits were found 100 miles away in the Pumpkin Buttes area of northeastern Wyoming....The work which the Geological Survey is doing for the USAEC was expanded in 1951, the Interior Department has now stated in its annual report for fiscal 1951, just released. This work was particularly enlarged in reconnaissance for radioactive materials, and the USGS conducted further studies in the phosphate fields of Florida, Idaho, and Montana.

CANADA- At Nesbitt LaBine Uranium Mines, promising uranium prospect adjoining Eldorado Mining & Refining's Beaverlodge Lake operation on the north, visible pitchblende has been reported in some five separate locations, in underground work to date. Each of these is regarded as unexpected, as headings have not yet reached the favorable zones as outlined by surface work. A single slash taken on a vein recently intersected in the first level crosscut was said to have returned 34 cars of ore averaging 0.35% uranium oxide (\$50.75) with massive pitchblende showing on the face of the slash.

COURSES & SEMINARS...in atomic energy...

Ann Arbor, Michigan- Industrial and legal problems created by the development of atomic energy will be under discussion at the University of Michigan Law School's Fifth Annual Summer Institute from June 26-28. Given in co-operation with the Michigan Memorial-Phoenix Project, the institute is aimed at answering the questions which businessmen and lawyers are beginning to face. Attention will be centered upon such questions as private capital for nuclear power, nuclear reactor developments, production and use of radioisotopes, labor-management relations, patent policies, security and censorship, radiation hazards to life and property and the problems centering around contract negotiation, performance and enforcement. Participants in the Institute will include Walker Cisler, president, Detroit Edison Co. and Carroll Wilson, president, Climax-Molybdenum Mining Co., and a former general manager of the USAEC. USAEC participants will include: Casper W. Ooms, chairman, Patent Compensation Board; Lawrence R. Hafstad, director of the Division of Reactor Development; and Dr. John C. Bugher, deputy director of the Division of Biology and Medicine.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

FROM THE MANUFACTURERS- Fast neutron dosimeter, Raychronix model E-1, is designed to provide easy measurement of fast neutron radiation hazards. This instrument gives a response that is proportional to human tissue sensitivity over the energy range of 0.2 to 10 Mev. The counter is of the proton recoil proportional type with 2:1 directional response and 10:1 pulse amplitude gamma discrimination. The model E-1 dosimeter has four ranges; 0-5, 50, 500 mrep/hr; ;0-200 integrated total count (approximately equivalent to 0.5 mrep). The battery box, containing batteries, vibrator power supply for counter and meter, is carried by a shoulder strap.--Radioactive Products, Inc., Detroit 26, Mich.

Universal counter and timer, model 550, provides a direct reading of elapsed time between any two events; a direct reading of the number of events that occur during a precise time interval; a means of measuring low frequencies; a means of measuring the duration of light interruptions of light flashes; and a method of measuring velocities. Time intervals over a range of 10-microseconds to one second can be measured, it is said, with an accuracy of plus-or-minus 10-microseconds. Events occurring either regularly or with random distribution at rates of from 20 to 100,000 events per second can be counted. The basic error is said to be plus-or-minus event; thus, at maximum range, accuracies of 0.001% are possible. By the use of auxiliary photocell attachments, the interval between two separate light flashes may be timed, or the duration of a light flash or a dark period may be determined with an accuracy of plus-or-minus 10-microseconds.--Berkeley Scientific Co., Richmond, Calif.

Utility scaler, model SC-19, provides a scaler for laboratories wishing to enter the field of radioactivity with a minimum of capital outlay. The SC-19 incorporates an electronic scale of 256, a wide range preset counter selection, and a high voltage supply for Geiger tubes. The SC-19 uses eight electronic scales-of-two, giving a scaling factor of up to 256, followed by a mechanical register. The scale selector switch makes possible the choice of four scaling factors of 32, 64, 128 and 256. The actual number of counts accumulated is determined by multiplying the register reading by the selected scaling factor, and adding the values of the neon interpolating lights. Predetermined counts ranging from 520 to 256,000 may be selected by means of the preset count switch which will stop the register at 10, 100, or 1,000. The utility scaler is said to have a resolving time of about 10-microseconds and a maximum counting rate of 1,000 CPM on the register. Counting rates of up to 60,000 CPM are said to result in less than 1% coincidence loss.--Tracerlab, Inc., Boston 10, Mass.

Particle accelerators, for neutron production, nuclear reactions, and scattering experiments. These accelerators, which can be supplied by this firm for operation in the range of 20 to 500 kilovolts, are said to be able to produce continuous beam currents ranging up to 500 microamperes of protons and deuterons, as well as to be able to accelerate heavier particles. Controls are provided for varying the beam from sharply focused circles to circles of the order of one inch in diameter with uniform current density.--American Instrument Co., Silver Spring, Maryland.

NEW DEVELOPMENTS- A direct current electromagnetic pump with no moving parts, and capable of pumping large quantities of intensely radioactive liquid metals rapidly, has been developed at Argonne National Laboratory, near Chicago. (Argonne is operated for the USAEC by the University of Chicago.) The device is now being used to pump a liquid metal coolant through Argonne's Experimental Breeder Reactor at the National Reactor Testing Station, Arco, Idaho. The pump consists essentially of a straight piece of tubing, two copper bars, and an electromagnet. The tubing is thin-walled stainless steel or nickel-chromium alloy which is pressed into a rectangular cross section. Heavy copper bars are silver soldered to opposite sides of this tubing. The assembly is then placed between the poles of an electromagnet and inlet and outlet pipes are attached to the tubing. An electrical current entering the wall, passes through the liquid, and develops in it a longitudinal thrust.

ATOMIC PATENT DIGEST...latest U. S. grants & applications...

Method and apparatus for measuring radioactivity. In part, an apparatus for indicating a change in voltage, comprising an oscillatory circuit including a plurality of electrical impedances, means connected to this oscillatory circuit for injecting thereinto a voltage that is out-of-phase with respect to the voltage that is developed across one of these impedances, and additional means responsive to voltage changes and serving to control said injecting means to vary the proportion of apparent change of the last-named impedance in the oscillatory circuit, the change in impedance causing a change in the frequency of oscillation. U. S. Pat. No. 2,590,873 issued April 1, 1952; assigned to Schlumberger Well Surveying Corp., Houston, Tex.

Leak detector. Comprises a mass spectrometer, including an ion generating source, this source being opposite an ion access aperture positioned in the ion baffle surface of the spectrometer, an ion beam receiver opposite an ion egress aperture in said baffle surface, an amplifier connected to the receiver and having at its output an indicator, and associated circuit whereby this indicator is rendered operative and inoperative in synchronism with the beam. U. S. Pat. No. 2,591,998 issued April 8, 1952; assigned to United States of America, (USAEC).

Neutron source. Comprising, in part, a mass of finely divided radioactive substance intimately dispersed among particles of beryllium, said substance comprising a salt of a metal selected from the radioactive group which includes radium, actinium-I, thorium-X and mesothorium, the particles of said radioactive substance being of a size not substantially larger than two microns, and the particles of the beryllium not larger than forty microns, with a jacket completely surrounding this mass, the jacket being formed of a non-radioactive material which emits neutrons when exposed to the radioactivity of the substance. U. S. Pat. No. 2,592,115 issued April 8, 1952; assigned to U. S. Radium Corp., New York.

Counting rate circuit. Comprises a counter, a source of power for the counter, amplifying means fed by this counter, with these amplifying means serving to clip pulses greater than those of a predetermined magnitude, inductive wave shaping means in the output of the amplifier to provide waves of similar shape, means for rectifying the output of said wave shaping means, an integrating circuit in series with this rectifying means, and a vacuum tube voltmeter for indicating the pulse rate. U. S. Pat. No. 2,592,416 issued April 8, 1952; assigned to United States of America (USAEC).

Radioactive marker. Comprising, in part, a projectile adapted to be fired into and to become lodged in a material so as to permit the subsequent detection thereof, consisting of a permanently magnetized portion, and a portion containing radioactive material, the magnetized portion serving at least in part as a support and enclosure for the radioactive material, thereby providing a projectile whose presence may be detected both by magnetic and by radioactive means. U. S. Pat. No. 2,592,434 issued April 8, 1952; assigned to Schlumberger Well Surveying Corp., Houston, Tex.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Chemistry and Physics of Radiation Dosimetry. A joint Department of Defense and Atomic Energy Commission report. Covers chemical effects of ionizing radiation, radiation chemical reactions in organic and other systems, and scintillation crystals. No. PB-105,925--Office of Technical Services, Dep't of Commerce, Washington 25, D.C. (\$4.75).

The Use of Radioactive Isotopes in Industry. Comprises nine papers read at a conference in England last year, held by the Federation of British Industries in collaboration with the Atomic Energy Research Establishment, Harwell. Main emphasis of the papers is on the application of radioactive isotopes to production processes. --Federation of British Industries, London (England) (2s. 6d.)

Sincerely,

The Staff,  
ATOMIC ENERGY NEWSLETTER